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a hole therein, and the second portion comprises a lid to close the hole.

B4 14. (NEW) The apparatus according to claim 12, wherein the hole is disposed relative to the first portion in a second direction perpendicular to the first direction.

15. (NEW) The apparatus according to claim 14, wherein the second portion is detachable from the frame to provide access to the first portion through the hole.

REMARKS

INTRODUCTION:

In accordance with the foregoing, claims 1, 4 and 7 have been amended and new claims 12-15 have been added. Claims 1-15 are pending and under consideration. Claims 3 and 4 are "objected to."

REJECTION UNDER 35 U.S.C. §102:

Claims 1, 2, 5-8 and 11 are rejected under 35 U.S.C. §102(b) as being anticipated by Shibuya et al.

Independent claim 1 recites "a fixed section detachably attached to the outer frame and extending in the axial direction while facing the movable section." These features are illustrated, for example, in present FIGS. 1 and 2. These FIGS. illustrate the fixed section 12, which includes lids 12a-12d. These lids 12a-12d are detachably attached to frames 10a-10d, and thereby serve as lids for hole sections 11a-11d formed in the frames 10a-10d. Attached to the lids are coils 13a-13d, which are opposite to magnets 9a-9d in the moveable section 8.

The invention of claim 1 is advantageous as compared to the related art described in the Background of the Invention, in which the linear motor is incorporated integrally into the injection mechanism, thereby making replacement difficult. Due to the detachable attachment of the lids of claim 1, repair or replacement of the motor is made easier and less dangerous.

In contrast, Shibuya et al. discloses a linear motor L having a linear movement body 2 to

move within a stationary body 4 including a casing 20 and a rear cover 21. Shibuya et al., FIG. 2. Instead of a fixed section being attached to an outer frame, as claimed, the rear cover 21 is connected to the casing 20. Thus, repair and replacement of the motor is difficult because access to the elements of the motor is not possible by removing the casing 20.

Accordingly, withdrawal of the rejection of claim 1 is requested. Claims 2, 5-8 and 11 are patentably distinguishable from Shibuya et al. at least due to their dependency from claim 1.

REJECTIONS UNDER 35 U.S.C. §103:

Claim 9 is rejected under 35 U.S.C. §103(a) as being unpatentable over Shibuya et al. in view of Chaya. Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over Shibuya et al. in view of EP 0744815 to Wacker.

It is respectfully submitted that Chaya and/or Wacker do not overcome the above deficiencies in Shibuya et al., and these references are not relied upon by the Examiner for this purpose.

Accordingly, withdrawal of the rejection is requested.

ALLOWABLE SUBJECT MATTER:

Claims 3 and 4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Based upon the foregoing, it is respectfully submitted that these claims are patentable over the cited references without being rewritten in independent form.

NEW CLAIMS:

New independent claim 12 is added and recites "an injection unit extending in a first direction; and a motor to linearly drive the injection unit in the first direction, comprising: a frame, a first portion attached to the injection unit to move within the frame in the first direction, and a second portion detachably attached to the frame and facing the first portion." It is respectfully submitted that the cited references do not disclose these features. New claims 13-

15 depend therefrom.

CONCLUSION:

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.


Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: 6-9-03

By: 
Michael J. Badagliacca
Registration No. 39,099

700 Eleventh Street, NW, Suite 500
Washington, D.C. 20001
(202) 434-1500

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please **AMEND** claims 1, 4 and 7 as follows. The remaining claims are reprinted for the convenience of the Examiner.

1. (ONCE AMENDED) An injection mechanism of an injection molding machine using a linear motor as a driving source for driving an injection screw shaft in the axial direction, wherein the linear motor comprises:

a movable section linked to the injection screw shaft and extending in the axial direction;

an outer frame; and

a fixed section [fixedly] detachably attached to the outer frame and extending in the axial direction while facing the movable section, wherein

a plurality of the linear motors each [constituted] comprised of the movable section, the outer frame and the fixed section are arranged to surround the screw shaft.

2. (AS FILED) An injection mechanism of an injection molding machine according to claim 1, wherein

the movable section of each of the linear motors comprises a polygonal prism having a plurality of pairs of plane parallel to each other, and electrical elements of each of the linear motors are provided on the two planes parallel to each other, respectively; and

the fixed section of each of the linear motors is fixedly attached to the outer frame so that electrical elements of the fixed section face the electrical elements of the movable section of each of the linear motors, respectively.

3. (AS ONCE AMENDED) An injection mechanism of an injection molding machine

according to claim 1, wherein the fixed section of each of the linear motors is detachably attached to the outer frame so that electrical elements of the fixed section face electrical elements of the movable section of each of the linear motors, respectively.

4. (TWICE AMENDED) An injection mechanism of an injection molding machine according to claim 1, wherein a hole section is provided in the outer frame, the fixed section of each of the linear motors is [constituted] comprised of a lid closing the hole section, and electrical elements of the fixed section of each of the linear motors are fixedly attached to an inside of the lid.

5. (AS FILED) An injection mechanism of an injection molding machine according to claim 1, wherein one end of the screw shaft is attached to a moving plate constituting the injection molding machine such that it can rotate but cannot move linearly, and the movable section of each of the linear motors is fixed to the moving plate.

6. (AS FILED) An injection mechanism of an injection molding machine according to claim 5, wherein the movable section of each of the linear motors is fixed to the moving plate through a load cell.

7. (ONCE AMENDED) An injection mechanism of an injection molding machine according to claim 2, wherein the movable section of each of the linear motors is [constituted] comprised of a prism having a rectangular cross section, and electrical elements of the linear motors are provided on four planes of the prism, respectively.

8. (AS FILED) An injection mechanism of an injection molding machine according to claim 1, wherein a cylinder for containing inside the injection screw shaft is attached to a front

plate constituting the injection molding machine, the outer frame constituting the linear motor is fixedly attached to the front plate.

9. (AS FILED) An injection mechanism of an injection molding machine according to claim 1, further comprising gap adjustment means for adjusting a gap between the outer frame and the fixed section, the outer frame and the fixed section constituting one linear motor.

10. (AS FILED) An injection mechanism of an injection molding machine according to claim 1, wherein a linear guide for linearly moving the movable section is formed on one constituent member of the outer frame.

11. (AS FILED) An injection mechanism of an injection molding machine according to claim 1, wherein a measuring shaft is linked to one end of the screw shaft, and the measuring shaft passes through a penetrating hole provided in a center of the movable section.

12. (NEW) An apparatus, comprising:
an injection unit extending in an first direction; and
a motor to linearly drive the injection unit in the first direction, comprising:
a frame,
a first portion attached to the injection unit to move within the frame in the first direction, and
a second portion detachably attached to the frame and facing the first portion.

13. (NEW) The apparatus according to claim 12, wherein the frame defines a hole therein, and the second portion comprises a lid to close the hole.

14. (NEW) The apparatus according to claim 12, wherein the hole is disposed relative to the first portion in a second direction perpendicular to the first direction.

15. (NEW) The apparatus according to claim 14, wherein the second portion is detachable from the frame to provide access to the first portion through the hole.